

The implications for the Royal Marines Command (RMC) of Operational Manoeuvre From The Sea (OMFTS) and Sea Dragon (SD).

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Subject Area - Warfighting

## **THE IMPLICATIONS FOR THE ROYAL MARINES COMMAND (RMC) OF OPERATIONAL MANOEUVRE FROM THE SEA (OMFTS) AND SEA DRAGON (SD).**

The dreamers are the saviors of the world. As the visible world is sustained by the invisible, so men, through all their trials and sins and sordid vocations, are nourished by the beautiful visions of the solitary dreamers. Humanity cannot forget its dreamers; it cannot let their ideals fade and die; it lives in them; it knows them as the realities which it shall one day see and know.

James Allen, As a Man Thinketh

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## EXECUTIVE SUMMARY

**TITLE:** The implications for the Royal Marines Command (RMC) of Operational Manoeuvre From The Sea (OMFTS) and Sea Dragon (SD).

**AUTHOR:** Major A T W Maynard Royal Marines.

**THESIS:** Arising from the demise of the former Soviet Union new sources of conflict have emerged world wide. The United States Marine Corps, as part of a United States initiative, is developing OMFTS, a new amphibious power projection strategy, and has established SD, an experimental process to test its new ideas and concepts for the next century. Elements of both OMFTS and SD are of utility to the RMC and will enhance the operational capability of 3 Commando Brigade Royal Marines if adopted.

**DISCUSSION:** Two avenues of analysis have been employed. Initially the potential global sources of conflict are discussed and analysed for their implications on the defence and maritime strategies of the United Kingdom. Secondly, OMFTS and SD are analysed in order to draw recommendations implicating which of their elements will be of value to the RMC.

**CONCLUSIONS/RECOMMENDATIONS:** By adopting the recommendations, not only will the operational capability of the Royal Marines be improved, but the United Kingdom's ability to project maritime power in support of the nation's defence strategy will be enhanced.

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## CHAPTER 1 INTRODUCTION

*Nothing endures but change.<sup>1</sup>*

*The only thing that one really knows about human nature is that it changes.  
Change is the one quality we can predicate on it.<sup>2</sup>*

Unprecedented complexity characterises the global security environment transformed since the end of the Cold War by three revolutions: Geostrategic, Information Technology (IT) and Governmental. Geostrategically relations among major powers reflect asymmetrical multipolarity as the United States (US) leads a Western hegemony; new technologies continue to provide previously unimaginable access to an ever expanding array of information; whilst in most developed countries, power is devolving to regional and local government and also to the private sector as the sphere of state control shrinks in favour of pluralism.<sup>3</sup>

Commensurate with these radical changes the US produced Joint Vision 2010 (JV2010), a defence initiative which analyses the strategic environment and produces clear guidance<sup>5</sup> enabling its military to evolve capabilities to match. JV2010's significance is explained in the words of the Chairman of the Joint Chiefs of Staff :

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<sup>1</sup> Heraclitus, From Diogenes Laertius, Lives of Eminent Philosophers, bk.IX, sec 8.

<sup>2</sup> Oscar Wilde, The Soul of Man Under Socialism (1895).

<sup>3</sup> National Defense University. Institute For National Strategic Studies, Strategic Assessment 1997 Flashpoints and Force Structure (1997), xi. Paraphrase of assumptions made in Executive Summary

The nature of modern warfare demands that we fight as a joint team. This was important yesterday, it is essential today, and it will be even more imperative tomorrow. JV 2010 provides an operationally based template for the evolution of the Armed Forces for a challenging and uncertain future [which] must become a benchmark for service and unified command vision.<sup>4</sup> Sea Dragon (SD), "a process for: change; visionary experimentation which seeks to enhance Naval and Joint expeditionary capabilities; rapid military innovation while meeting current commitments; and a means for insertion of science and technology to enable the warfighter,"<sup>5</sup> is the United States Marine Corps' (USMC) visionary commitment to adapting to global changes, experimenting with innovation including such new concepts such as Operational Manoeuvre From The Sea (OMFTS).

Emulating the US, the United Kingdom (UK) has also undergone self analysis concluding that its "Post-Cold War Security Policy is no longer concerned with defence of territory but on exerting influence internationally to secure a peaceful and favourable environment. As a power of residual but limited economic strength this must be achieved at minimum cost and minimum risk."<sup>6</sup> This new strategy essentially requires "a critical mass of military forces with the in-built flexibility to address and respond to a range of situations where political direction dictates the application of armed force."<sup>7</sup> Achieving this the 1995 British White Paper emphasised the concept of National Contingency Forces (NCF) derived from the

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<sup>4</sup> General John M. Shalikashvili, United States Army, " Joint Vision 2010: America's Military Preparing for Tomorrow" Joint Force Quarterly (Summer 1996):35.

<sup>5</sup> Tony Wood, Col USMC, "Sea Dragon/Commandant's Warfighting Laboratory Presentation," lecture presented at CGRM's Study Period at Whale Island, Portsmouth, Great Britain, 4 December 1996. Script copy provided by Commandant's Warfighting Laboratory

<sup>6</sup> Eric Grove, The Army and British Security After the Cold War Defence Planning for a New Era (Strategic and Combat Studies Institute. The Occasional Number 20), 30.

<sup>7</sup> Martin Edmonds, British Army 2000 External Influences on Force Design (Strategic and Combat Studies Institute, The Occasional Number 21), 74-75.

three Defence Roles and their resulting force missions<sup>8</sup>, where "the major determinant of the overall size, capability and readiness of [UK] forces [is] still the contribution to common security through NATO".<sup>9</sup> Created to reflect the NCF concept, the Joint Rapid Deployment Force (JRDF), of which 3 Commando Brigade Royal Marines (3 Cdo Bde RM) is an element, reflects the likelihood "that future operations would be of low rather than high intensity and that Britain would find itself engaged in a number of concurrent peace support operations or similar '*operations other than war*' [where] Coalition and joint operations [are] likely to be the rule."<sup>10</sup>

In the global security environment typified by uncertainty, clearly the Royal Marines Command (RMC) has a significant role in the UK's contribution to that environment, although the harsh realities of a tight military budget will demand strict economic control and prudent spending. The USMC's SD process presents a unique opportunity for the RMC to participate freely in an innovative five year experiment, testing Naval Expeditionary Force (NEF) concepts for the 21st Century, where a complementary Royal Marine vision for the future can be developed. The rationale for adopting this opportunity is the essence of this paper. The approach initially defines global security challenges and terms (OMFTS and SD), before explaining their implications to the RMC. Finally, recommendations which amplify the benefits of being part of SD are made before concluding.

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<sup>8</sup> Grove,16-17. The reader requiring to know more details on this process will find it in these pages.

<sup>9</sup> Grove,18.

<sup>10</sup> Grove,19.

## CHAPTER 2

### SOURCES OF FUTURE CONFLICT

*What made war inevitable was the growth of Athenian power and the fear which this caused in Sparta<sup>11</sup>*

#### INTRODUCTION

Some perceive that the end of the Cold War and the disintegration of the Soviet Union removed the threat of a titanic superpower clash, which, if history can be a guide, would have been as inevitable as the Peloponnesian War. Theoretically this should have created a world wide hegemony of peace-loving states led by the United States of America (USA). In reality it released a deluge of new actors and interests, creating new paradigms for international relations far removed from the bi-polar Cold War era.

Significantly, the identity of these new actors is not confined to states with clearly defined borders; they also include emerging states, "trade unions, professional associations, drug cartels, Mafia gangs and multinational companies - all, each in their own way - struggling for power, influence, money and clients."<sup>12</sup> For many of these actors boundaries do not exist; money and investments flow freely on international finance markets; drugs secretly cross from country to country taking an inherent but illegal power to influence; terrorism's deadly shadow

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<sup>11</sup> Thucydides, History of the Peloponnesian War, (Penguin Classics), I, 23.

looms darkest where the media will project its message globally and minorities strive for recognition and frequently their own state identity often with the sympathy of other countries and states.

In many cases legitimate and internationally recognised governments cease to control and at best can only influence these non state actors, all of whom have their own interests to pursue. For the less scrupulous the availability of weapons, high technology and a desire for power ensures that global security is more unstable than at any time during the Cold War when both East and West preserved discipline within their spheres of influence.

There are a plethora of specific sources of conflict influencing to varying degrees the deployment of British military forces overseas. However, for the purpose of setting the changing global scene which has generated OMFTS and SD, three distinct areas: the emergence of smaller more numerous states, population growth and technology will be discussed as they encompass most, if not all, sources of conflict.<sup>13</sup>

### THE EMERGENCE OF SMALLER MORE NUMEROUS STATES

Causes for the increasing numbers of smaller states are succinctly described by Paul Kennedy:

...the collapse of Western colonial empires, and more recently the disintegration of the USSR, meant that national units did indeed become 'smaller and more numerous,' so that almost three times as many states existed by the early 1990's as there had been sixty years earlier.<sup>14</sup>

These new states established many of the "attributes of sovereignty - national government, armed forces, border/customs posts, budgets, currency, and so on."<sup>15</sup>

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<sup>12</sup> Curt Gasteyger, Sources of future conflict: A global overview (British Security 2010) November 1995. 16.

<sup>13</sup> Defence Research Agency, Maritime Operations 2015,( November 1995). Any reader seeking an in depth study on the changing world should refer to this document.

Unfortunately, they frequently harboured age-old ethnic or religious grievances with neighbouring states which invariably surfaced during the associated friction and confusion characteristic of a young state. For example in November 1995, of the thirty three significant armed conflicts which were being waged around the world, all but one were ethnic or ethnic-religious wars which started as civil wars, insurgencies or wars of succession.<sup>16</sup> The states emerging from the former Soviet Union (FSU) are rife with ethnic tensions caused not only by government forced population moves but also by their own history, characterised by centuries of rivalry between the competing migrant waves of nomads, hillsfolk and plainsmen. The resulting territorial disputes and religious conflicts generate human migrations, often to neighbouring states, resulting in internal tensions and friction between states. In such an area where the UK's interests are deemed threatened, the capability to project power amongst states in conflict to preserve and protect them, either unilaterally or collectively, is essential. In the Balkans for example, an area of strategic significance to NATO and therefore also to the UK, British involvement was unavoidable in the region and reflects the UK's commitment to the alliance.

## POPULATION GROWTH

By the middle of the next century the world population may soar to ten billion with the steepest population growth occurring in the poorest regions causing an ever increasing gap between them and the developed regions, which have slower growing populations and an increasing percentage of older people. The result is a mismatch between "where the world's riches, technology, good health, and other benefits are to be found and where the world's fast

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<sup>14</sup> Paul Kennedy, *Preparing for the Twenty-First Century* (New York:Vintage Books 1993), 330.

<sup>15</sup> Kennedy, 330.

<sup>16</sup> Defence Research Agency, *Maritime Operations 2015*, ( November 1995).

growing new generations, possessing few if any of those benefits, live."<sup>17</sup> Inevitably, left uncontrolled, population will be a significant source of international instability in the future.

There are a number of problems created from this population growth and its uneven distribution, estimated by the United Nations (UN) to deteriorate further so that by 2025 eighty-five percent of the world's population will live in cities, of which over one hundred will have populations in excess of twenty million.<sup>18</sup> Since "300 of the world's largest cities are close to the ocean"<sup>19</sup> the littorals consequently contain an ever present source of potential conflict. Countries and state governments will have to implement strategies to provide food and water to sustain growing numbers as well as raw materials to support industry. In particular the provision of clean water is becoming a problem in some areas and is an increasingly likely source of conflict.<sup>20</sup> To put it into context, the World Bank predicts that \$600 billion will have to be spent over the next decade to provide clean water world wide; of this, the World Bank itself expects to provide \$40 billion.<sup>21</sup>

On the international level the most critical area is no doubt the Middle East with its three problem areas: the Nile valley; the Near East with Israel and Palestine as its centre, and the Turkish-Iraqi-Syrian triangle.<sup>22</sup> This is of significance to the UK not only through environmental damage and resulting human migration it will provoke, but also in the efforts required to prevent any conflict arising in a region where stability is essential to preserve the free flow of oil through the Suez Canal.

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<sup>17</sup> Kennedy, 331.

<sup>18</sup> R. Gangle , Senior Operations Advisor CWL, interview at Quantico by author, 20 December 1996. The figures quoted came from a UN conference "Habitat 2000".

<sup>19</sup> The United Kingdom's Approach To Amphibious Operations, Draft paper written by the Maritime Warfare Centre, HMS DRYAD, UK.

<sup>20</sup> Gasteyer, 17.

<sup>21</sup> George Joffe, The Impact on Security of Demographic and Environmental Change (British Security 2010), 45.

<sup>22</sup> Gasteyer, 17.

Efforts to ensure food is available for growing populations coupled with a drive to develop economies may cause environmental problems which could become sources of conflict in the future, as Paul Kennedy explains:

...over the past half century there has been exponential growth in industrial emissions, especially in newly developed countries intent upon flat-out growth; the draining of wetlands and aquifers, the onslaught on tropical forests, and the overgrazing of plains and savannahs are nowadays far more extensive; and the evidence is at hand of a 'greenhouse effect' that could change ecologies in all sorts of ways.<sup>23</sup>

The sources of conflict which could ultimately involve the UK arise firstly from the 'greenhouse effect' which, causing climatic changes, will result in sea level rises even for the most environmentally responsible; secondly, it is estimated that the earth cannot sustain a population of 10 billion if it continues to devour resources at current rates. In this environment the agriculturally rich European countries will consequently face the envious scrutiny of agriculturally poorer countries and it will be the collective defence, enjoyed through NATO, which will help to protect the UK and her neighbours.

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<sup>23</sup> Kennedy, 331.

## TECHNOLOGY

A large population growth tends to generate an exodus from poorer rural areas towards the wealthier centres of population, cities or large towns, exacerbating problems caused by new technology.<sup>24</sup> Unfortunately this tendency reinforces the unemployment situation as new technology improves production techniques, through automation which reduces employment opportunities. However, there are certain innovations which will have an even greater long term effect. For example, it is predicted that a biotechnology revolution will occur during the next two decades which will make traditional agriculture redundant and cause increased rural unemployment. If considered in conjunction with the potential effects of multinational companies efforts to free themselves from their roots to compete for global markets, by adopting new technology and relocating production, the genesis of commercial confrontations and social instability will be sown. Significantly, Paul Kennedy describes these problems provoking "immense bouts of violence, as tens of millions crowd into cities in the developing world and find no work available."<sup>25</sup> Consequently, it is essential for the UK to ensure it has the capability to operate in an urban environment, particularly in cities, as examples of conflicts taken from the last six years include: Somalia, Beirut, Kuwait, Northern Ireland and Bosnia, all of which included urban operations.<sup>26</sup>

Finally, the impact of technology on communications and its global effect must be mentioned, as it has served to pass information world wide making "richer and poorer countries

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<sup>24</sup> George Joffe. The Impact on Security of Demographic and Environmental Change. British Security 2010. The reader wishing to know more details concerning the impact of large population growth should read George Joffe's essay and chapter 2 of Kennedy's Preparing for the Twenty-First Century.

<sup>25</sup> Kennedy, 332. This paragraph is based on Kennedy's original ideas.

<sup>26</sup> R. Gangle , Senior Operations Advisor CWL, interview by author, 20 December 1996

more aware of the gap between them...and stimulated legal and illegal migration."<sup>27</sup> The resulting instability becomes yet another potential source of conflict.

## SUMMARY

Threats in the strategic environment are no longer clearly defined as in the Cold War era. Instead they have been replaced by a multitude of potential conflict sources, often closely linked, which stretch around the globe and affect every region. Characteristic of this environment are: increasing numbers of emerging states; a rapidly rising population world wide, which amplifies the demographic gap between rich and poor countries; and dramatic technological advances. Consequently, "...increasing economic, ethnic, territorial and religious pressures, together with resources and demographic problems in a shrinking globe, demand a coherent strategy for reducing and containing these pressures."<sup>28</sup> The UK is developing its strategy which will require capabilities to project power ashore and in the littorals regions of the world, against new threats spanning the conflict spectrum. Within this environment, which will invariably include coalition operations, the opportunities that will be shown to exist in the SD experimental process that will assist in the development of the UK's strategy should be seized.

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<sup>27</sup> Kennedy, 333.

<sup>28</sup> A Concept for UK Maritime Power Projection in the Littoral and Ashore into the 21st Century, Draft Royal Navy paper.

## CHAPTER 3

### UK DEFENCE STRATEGY

#### NATIONAL DEFENCE POLICY

The UK's National Defence policy provides the basis from which any investigation of the future should be based, since it is necessary to know where one is before deciding where one would like to be. "The aim of United Kingdom security is to maintain the freedom and territorial integrity of the United Kingdom and its Dependent Territories and its ability to pursue legitimate interests at home and abroad within a peaceful and stable world."<sup>29</sup> The UK's interests abroad are varied and extensive enough for British security to be viewed in a global perspective. "This is reflected in the country's status as a permanent member of the United Nations' Security Council and involvement in a wide range of international bodies, such as the Group of Seven most powerful economies, the European Union, NATO and the Commonwealth."<sup>30</sup> Overseas interests for the UK not only include Dependent Territories (DT) and "the 8.6 million British nationals living abroad"<sup>31</sup>, frequently in or near areas considered politically unstable, but they also include those associated with trade, since Britain "exports one quarter of its produce, more than Germany or France and...is reliant on the supply of raw materials from overseas, on the

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<sup>29</sup> British Defence Doctrine (Joint Warfare Publication [JWP] 0-01, London, MOD CS(M)G, 1996.) 5-6.

<sup>30</sup> British Defence Doctrine (Joint Warfare Publication [JWP] 0-01, London, MOD CS(M)G, 1996.) 5.4 - 5.5.

<sup>31</sup> The Maritime Dimensions Of Defence In The Early 21ST Century (NAV/P(97))3.

secure transport of goods by sea and by air and the stable world situation, conducive to trade."<sup>32</sup>

To achieve this security the UK Defence Policy comprises three overlapping Defence Roles (DR). DR1 provides for the defence of the UK and her DTs which includes the provision of a strategic and sub-strategic nuclear capability. DR2 revolves around NATO membership and ensures the protection of the UK and her allies. DR3 concerns the promotion, through multinational, UN, NATO or coalition operations, of the UK's wider security interests by maintaining international peace and security.<sup>33</sup>

### NATIONAL MARITIME POLICY

It is from the DRs that British Maritime Policy is derived and its application, either unilaterally or as part of a joint or combined force, can be divided into three categories: military (power projection and sea control), constabulary and benign.<sup>34</sup>

a. Military (Power Projection) Application of Maritime Power. The most lethal of all weapons, the UK strategic nuclear deterrent, is at the top end of the scale of military power projection from the sea since the sea offers a unique medium in which submarines may avoid detection. Moving down the scale, "maritime combat power can be projected ashore using manoeuvre from the sea through organic attack aircraft, submarine and surface launched land attack missiles, naval gunfire support (NGS), amphibious forces and special forces."<sup>35</sup> The main contributors in such an environment are RN carriers and specialist amphibious ships, which represent considerable capabilities whose relevance in today's global security environment is critical, especially when significance of the littorals is considered:

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<sup>32</sup> British Defence Doctrine (Joint Warfare Publication [JWP] 0-01, London, MOD CS(M)G, 1996.) 5.2.

<sup>33</sup> Design for Military Operations - The British Military Doctrine (Army Code 71451, 1996.) 2-1 - 2-2.

<sup>34</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London, HMSO). 105.

Approximately 2/3rds of the world's surface is covered by sea and over half of the world's population live within 200 km of a coast. 80% of the world's countries have littoral borders. 300 of the world's largest cities and most of the world's nuclear reactors are close to the ocean. The sea and the freedom to move on it is the pivotal strategic medium.<sup>36</sup>

Maritime forces are also employable in combat operations in defence of forces ashore, achieved by manoeuvring to protect a maritime flank, denying its use to other vessels, or additionally by providing air defence. Non-Combatant Evacuation Operations (NEO) are also a role of the military in the projection of power ashore, as is supporting diplomacy, by poising off shore to deter an aggressor or demonstrate resolve as part of a coalition. Lastly, power projection ashore by maritime forces can reinforce Peace Support Operations (PSO), carried out under the authority of the UN, as the Royal Navy's contribution to UNPROFOR in the former Yugoslavia demonstrates.<sup>37</sup>

b. Military (Sea Control) Application of Maritime Power. There are two strands to this, operations against enemy forces and protection of maritime trade. By "denying the enemy the ability to use maritime forces and sealift to move resources and conduct trade, erodes his strategic capability to wage war."<sup>38</sup> Conversely, the same can be employed against the UK and therefore the resources employed to protect maritime trade are the same and include: nuclear powered attack submarines, destroyers and frigates, maritime patrol aircraft and mine counter measure vessels (MCMV).

c. Constabulary Application of Maritime Power. Fishery protection, maritime counter-terrorism, peacekeeping and embargo, sanctions and quarantine enforcement are some of the

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<sup>35</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London, HMSO). 83.

<sup>36</sup> The United Kingdom's Approach To Amphibious Operations, Draft paper written by the Maritime Warfare Centre, HMS DRYAD, UK.

<sup>37</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London. HMSO). 91.

<sup>38</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London. HMSO). 95.

tasks that constitute the constabulary category of British maritime strategy. Often conducted under international mandate to ensure legality, these tasks can "be subject to counter-attack, so a level of local sea control may be required to ensure the protection of enforcement forces."<sup>39</sup>

d. Benign Application of Maritime Power. Humanitarian and disaster relief characterise this application which can be instrumental in preserving the regional stability in an area, as events after a cyclone struck in Bangladesh in May 1991 demonstrate. The devastation included widespread flooding along the coastal regions.

RFA FORT GRANGE with 2 assault helicopters, 6 rigid raiding craft and some additional Royal Naval and Royal Marine personnel was deployed to assist in the delivery of much needed food and stores. She acted as an enabling asset for the local authorities in their efforts to recover from the effects of the cyclone.<sup>40</sup>

Since maritime forces can deploy world wide with their own logistical support they have an inherent flexibility which makes them extremely useful in disaster relief operations. This is significant since DR 1 requires disaster relief to be provided to DTs, for example in the RN and RM assistance given to the island of Montserrat following volcanic activity in 1996, which included the deployment of elements from the Commando Logistic Regiment RM.

#### ROLE OF THE RM.

In the application of UK maritime policy, the projection of military power from the sea demonstrates roles where the unique relationship enjoyed between the RN and RM in the conduct of amphibious operations, reinforced by the high training standards and discipline of the RM, ideally qualifies them to conduct such operations; particularly, combat operations against the land, NEOs and PSO. In combat situations, "amphibious operations can be assaults, raids,

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<sup>39</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London. HMSO). 101.

<sup>40</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London. HMSO). 103.

demonstrations, feints or withdrawals.<sup>41</sup> These links also extend into the constabulary and benign applications where the RM can be employed in peacekeeping operations and humanitarian and disaster relief, the most notable in recent years being the humanitarian relief provided to the Kurds in the wake of the Gulf War. In these situations the RM and RN depend intimately on each other for success, reinforcing the case for both to share a future vision for amphibious operations. This vision serves as the catalyst for the current development of new amphibious doctrine centred around the projection of power ashore in the littorals, a capability derived from analysing the new world order where multiple threats exist in coastal regions. This strategic perception motivated the US, who share the same approach as the UK for a dual Navy and Marine solution, although on a much larger scale, to develop OMFTS.

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<sup>41</sup> The Fundamentals of British Maritime Doctrine (BR 1806, London. HMSO). 83.

## CHAPTER 4

### OPERATIONAL MANOEUVRE FROM THE SEA (OMFTS).

*"Sea based power projection forces - namely, carrier battle groups, and amphibious groups embarked with Marines - offer to decisionmakers military power that is multifaceted in capability and deployable around the world"<sup>42</sup>*

#### THE USN AND USMC TEAM.

The UK is realising the value of a close relationship, previously unprecedented, between the RN and the RM. This follows close behind the US initiative, manifest in OMFTS, which "exploits the Navy-Marine Corps Team's expeditionary capabilities and provides a framework for applying maneuver warfare to maritime operations within a joint operations context."<sup>43</sup>

#### OMFTS - THE CONCEPT.

The myriad of potential conflict sources creates a world characterised by uncertainty as threats to security span the conflict spectrum. Conceptually OMFTS was the initiative designed to permit the USMC to react to these threats whilst also maintaining an unprecedented ability to be flexible, by poising off shore and landing at any one of a number of different locations. OMFTS origins are threefold: the 1992 visionary discussion between the Secretary of the Navy, the Chief of Naval Operations and the Commandant of the Marine Corps; the implications of the White Papers "...From the Sea" and "Forward ...From the Sea", produced in 1992; and the perceived growing significance of the world's littorals. "This approach places unprecedented

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<sup>42</sup> Dick Cheney, *Making Marines, Winning Battles (USMC Concepts and Issues 97)*. 14.  
<sup>43</sup> *Making Marines, Winning Battles (USMC Concepts and Issues 97)*. 14.

emphasis on littoral areas, requires more intimate co-operation between forces afloat and forces ashore, introduces the concept of the naval expeditionary force, and provides the foundation for Operational Maneuver From the Sea.<sup>44</sup> The concept also seizes the opportunity to incorporate new technologies, especially concerning "enhancements in information management, battlefield mobility, and the lethality of conventional weapons".<sup>45</sup>

These ideas were combined as the basis of a Marine Corps concept paper, published in June 1996, called Operational Maneuver From The Sea, which also served as a springboard for many ideas to be experimented and debated in The Commandant's Warfighting Laboratory (CWL). This process of experimentation is known as SD. Amphibious operations are at the heart of OMFTS because the USMC has realised that if the USA desires to influence events overseas, then it " requires a credible, forwardly deployable power projection capability. In the absence of an adjacent land base, a sustainable forcible entry capability that is independent of forward staging bases, friendly borders, overflight rights, and other politically dependent support can only come from the sea"<sup>46</sup>, also, as already stated, the world's littorals are future sites of conflict.

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<sup>44</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore ( Marine Corps Association, June 1996)

<sup>45</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore ( Marine Corps Association, June 1996).

<sup>46</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, ( Marine Corps Association, June 1996.)

## CHARACTERISTICS.

OMFTS identifies a number of areas which present problems or "challenges". They are referred to as capabilities in the concept paper but realistically they are also OMFTS characteristics and are listed below along with two other others (h and i) which are not considered capabilities, but are incorporated because of their fundamental significance to OMFTS.

### Characteristics of OMFTS

- a. Mobility.
- b. Intelligence.
- c. Fires.
- d. Aviation.
- e. Mine Countermeasures.
- f. Command and Control.
- g. Combat Service Support.
  
- h. Doctrine.
- i. Training and Education.

Before each characteristic is discussed it is essential to understand that "OMFTS treats the littoral as a single environment in which the co-operation of units on land, at sea, and in the air is based on a shared vision of what must be done (and) can only be achieved if the naval expeditionary force is organized and trained as a highly cohesive team."<sup>47</sup>

a. Mobility. A visionary element of OMFTS is its combined use of sea, land and air as a seamless manoeuvre space. A beachhead should no longer be considered as a tactical necessity for establishing a lodgement from which to conduct further operations. "While some operations may require the establishment of bases ashore, the practice of separating ship-to-shore movement

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<sup>47</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, (Marine Corps Association, June 1996.)

from the tactical and operational maneuver of units ashore will be replaced by maneuvers in which units move, without interruption, from ships at sea to their inland objectives."<sup>48</sup> The implication of this freedom of manoeuvre is that amphibious forces must have the means to achieve it, and in all weathers, night or day, over long distances.

b. Intelligence. A high tempo is one of the keys to successful OMFTS. Achieving this depends on swift decisions by the commanders; intelligence is a critical factor which expedites this. However, to speed up the intelligence process over an adversary, OMFTS seeks to disseminate information by employing technological means, in conjunction with carefully placed intelligence specialists who "must be capable of rapidly making judgements about what the enemy is likely to do."<sup>49</sup>

c. Fires. As OMFTS incorporates a greater freedom of manoeuvre over a larger battlespace, it is essential that forces are always capable of being supported by fire. In light of this, "to provide effective fires, forces afloat and ashore require the ability to deliver fires with increased range and improved accuracy and lethality."<sup>50</sup> This also implies that the forces afloat, as well as those on land and in the air, will require an efficient fire support co-ordination process.

d. Aviation. Aviation is an integral element of the combined arms battle envisioned by OMFTS. As a conflict could occur anywhere in the world's littorals, "combat aircraft must be

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<sup>48</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, ( Marine Corps Association, June 1996.)

<sup>49</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore,( Marine Corps Association, June 1996.)

<sup>50</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, ( Marine Corps Association, June 1996.)

capable of operating from a variety of ships and austere bases ashore, perform a variety of missions, and land on a wide variety of surfaces."<sup>51</sup>

e. Mine Counter Measures (MCM). OMFTS takes into consideration the threat from enemies across the entire spectrum of conflict. Included in this are those who are unable to afford sophisticated equipment, consequently employing cheaper weapons on a larger scale, such as mines. This capability allows ship and landing craft mobility to be hampered and is especially suitable to the littorals, where vessels may become concentrated around preferred landing areas. To cope with this threat OMFTS seeks to "develop and enhance (its) counter-mine/obstacle reconnaissance, mine marking and clearing capabilities, precision navigation, and in-stride breaching to support maneuver at sea, ashore, and during the transition from sea to land."<sup>52</sup>

f. Command and Control. This is the key to any operation and OMFTS seeks fundamentally to change accepted procedures and replace them with a faster, accurate and more efficient system. This will result in a shift away from communication systems to information networks. "Techniques previously employed to compensate for the inability of fire support units to see the battlefield will give way to techniques that exploit the fact that combatant units will be better informed than ever before."<sup>53</sup> In this manner all information will be transmitted digitally across the same nets allowing unprecedented availability to all who are permitted access.

g. Combat Service Support (CSS). If OMFTS incorporates the capability to land forces on objectives inland at great distances from their seabased launch platforms, then commensurate with this is a sustainment capability. "Speed and mobility comparable to that of the assault

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<sup>51</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, ( Marine Corps Association, June 1996.)

<sup>52</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore (Marine Corps Association, June 1996.)

forces will be necessary for CSS elements responding to the dynamic demands of OMFTS. CSS flow must be efficient, secure, and timely, with the option to remain sea-based or to build up support areas ashore.<sup>54</sup> Inherent in this is a dynamic management system capable of reacting to and co-ordinating all CSS demands.

h. Doctrine. OMFTS does not require completely new doctrine to be written, as a component part of it, namely manoeuvre warfare, already has comprehensive doctrine which is compatible at least in US terms. However, the OMFTS concept paper does identify the following areas which require doctrine review: fire support, logistics, command and control, and ship-to-objective manoeuvre.

i. Training and Education. OMFTS can only be a successful battle winning concept if the commanders who execute it thoroughly understand its potential and have the intellectual dexterity to keep pace with a constantly changing three dimensional battlespace. Increasingly complex networked communication systems that new technology is creating will generate an unprecedented availability of information to commanders and subordinates alike, requiring faster decision cycles to maintain operational tempo. To prepare for this challenge all levels of command need to be educated and exercised regularly in a realistic environment as possible. This would serve to improve "their capacity to identify patterns, seek and select critical information, and make decisions quickly on an intuitive basis. This intuitive based decision

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<sup>53</sup>Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, (Marine Corps Association, June 1996).

<sup>54</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, (Marine Corps Association, June 1996).

making cycle will be enhanced by extensive investment in education, wargaming and combat simulation activities, and battlefield visualization techniques."<sup>55</sup>

### OMFTS AND THE ROYAL NAVY AND ROYAL MARINES.

The UK's security policy requires a capability for global reach and power projection which is reflected in its DRs. Maritime strategy, embedded in all DRs, enables the UK to achieve this and, amongst other objectives, project amphibious power world wide, influencing where required the varying challenges to security rife in the littorals. "Maritime forces are particularly well suited to supporting the entire range of military operations required to maintain United Kingdom national security interests, from forward presence, through crisis response to warfighting."<sup>56</sup> OMFTS is the operational concept that links activities at sea with the projection of force ashore, where the RM are a fundamental element. This also serves to reinforce the value of the joint RN and RM team approach to future maritime operations currently articulated in the emerging UK amphibious doctrine.

### SUMMARY.

The new amphibious doctrine is part of a developing UK strategy to respond to new threats that span the conflict spectrum. This strategy is the equivalent of the US JV 2010 which, combined with "Forward...From the Sea", provides the Navy and Marine Corps with a guide to aggressively prepare for the future warfare environment, through innovative ideas including the Navy At-Sea Battle Lab and the CWL.<sup>57</sup> In developing UK strategy the RN and RM team will continue to be emphasised as evidence demonstrates they have a unique relationship. To

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<sup>55</sup> Operational Maneuver From The Sea. A Concept for the Projection of Naval Power Ashore, ( Marine Corps Association, June 1996).

<sup>56</sup> The United Kingdom Approach To Amphibious Operations, (Draft paper written by the Maritime Warfare Centre, HMS DRYAD, UK).

<sup>57</sup> Making Marines, Winning Battles (USMC Concepts and Issues 97). 15.

capitalise on this for the future and also incorporate technological advances in weapons, sensors, communications and command systems, requires a test bed where existing synchronicity of thought can be practically examined and realised. The SD five year experimental process conducted at the CWL is one such test bed.

## CHAPTER 5

### SEA DRAGON (SD)

*"I believe that the efforts of the warfighting laboratory will be as important to the Marine Corps of the 21st century as the work done at Quantico in the 1930s was to the Marine Corps of World War II. The lab will serve as the focal point for warfighting innovations."<sup>58</sup>*

#### INTRODUCTION

SD is a process of experimentation conducted by the CWL. Specifically the CWL will, "serve(s) as the cradle and test bed for the development of enhanced operational concepts, tactics, techniques, procedures, and doctrine which will be progressively introduced into the FMF (Fleet Marine Forces) in concert with new technologies."<sup>59</sup> In keeping with the visionary nature of SD, traditional US Cold War threats have been discarded in favour of those perceived to be characteristic of future conflicts. The super power threat of the FSU has been replaced by a world-wide myriad of threats across the conflict spectrum. Characteristic of these threats is the growing importance of dominating the world's littorals and sea-lines of communication (SLOC). In such an environment NEF, including an amphibious capability to project power ashore, using OMFTS, are crucial.

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<sup>58</sup> Chris Lawson, " General Charles C Krulak Quoted in Taming the Dragon," Navy Times,25 March 1996.

<sup>59</sup> General Charles C Krulak, The 31st Commandant's Planning Guidance (A Marine Corps for the 21st Century) (Marine Corps Association Marine Corps Gazette, August 1995.)

The CWL assumes in the SD experimental process that, "The Marine Corps of the 21st Century remains closely allied with the Navy, and focuses on operations on the littorals."<sup>60</sup> Additionally, it does not currently envision a change to the current FMF structure of Air Combat Element (ACE), a Ground Combat Element (GCE), a Combat Service Support Element (CSSE), and a Command Element (CE), although experimentation will occur within each element to reshape them into lighter, more flexible and manoeuvrable forces with a greater reliance on technology.

### THE OPERATIONAL CONCEPT

The development of, "the ability to find the enemy, target him, and destroy or disrupt his activities, while limiting his ability to do the same",<sup>61</sup> is the operational concept which provides SD with a focus for its experimentation. The aspiration is that, through experimentation, a digital picture of the battlefield will be created to display all friendly positions and all known enemy locations. Own positions will be automatically calculated continuously by a Global Positioning System (GPS) and relayed digitally to a Command and Co-ordination (C2) system, whenever a radio is used or when required. Enemy positions will be located and ultimately digitally identified by a lattice of six man squads operating independently over a wide area up to two hundred miles deep. They will be equipped with sophisticated but user friendly target locating and designating devices that will similarly be linked into the C2 system; the aim being to give them instantaneous access to their commanders and fire support assets. "The squads' primary missions will be to engage the enemy with indirect fire, thus creating confusion and presenting the enemy commander with a multitude of events and actions to deal with."<sup>62</sup> The

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<sup>60</sup> Sea Dragon draft paper.

<sup>61</sup> Sea Dragon draft paper.

<sup>62</sup> Sea Dragon draft paper.

desired end result is the capability to shape the battlefield around an enemy creating a favourable environment for one's own manoeuvre and, ultimately, a heavy forces attack; simultaneously, lighter forces would remain in support, targeting, screening flanks and gathering intelligence.

### THE EXPERIMENTAL PROCESS

To make this concept achievable, a five year experimental programme was drawn up. There are three phases to the SD five year experimental process (FYEP). They are known as HUNTER WARRIOR, URBAN WARRIOR and CAPABLE WARRIOR. Within these phases the CWL will utilise the following eight stage experimental process:<sup>63</sup>

1. Experimental objectives developed and approved.
2. Planning and co-ordination conducted with appropriate commands and agencies.
3. Experiment leader/Director preparation.
4. Wargaming and simulation phase.
5. Adjustments.
6. Field experimentation.
7. Formal critique and analysis.
8. Results forwarded to the Commandant Marine Corps (CMC).

Additionally, in all phases, experiments will be divided into two types: Limited Objective Experiments (LOE) and Advanced Warfighting Experiments (AWE). Both are closely linked as the successful LOEs ultimately combine to produce the AWE. The LOEs are also extremely flexible and can be extended or closed depending on their progress.

- a. Limited Objective Experiments (LOE). An infinite number of LOEs may be conducted by the FYEP. They are designed to investigate concepts and equipment, while

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<sup>63</sup> Gangle, Senior Operations Advisor CWL, interview by author, 20 December 1996.

emerging technology may support or facilitate a particular capability or indicate those that have no utility.

b. Advanced Warfighting Experiments (AWE). Each phase of the FYEP will incorporate an AWE which will be a major event. These will focus on testing the capabilities developed from the results of the LOEs.

### THREE PHASES OF EXPERIMENTATION

a. Phase One - HUNTER WARRIOR (January 1996 - March 1997/April 1997 - September 1997).

"Hunter Warrior will focus on the Extended, Dispersed, Littoral Battlefield "<sup>64</sup> and be conducted in two parts. Firstly, from January 1996 - March 1997, operations over an unconventionally large battlefield, centred around small, well camouflaged teams employed to target and direct fires, are designed to test advanced command and control along with innovative "virtual seabased" CSS. Secondly, from April 1997 - September 1997, the focus will switch from ground operations to naval operations , where the emphasis will be on " the integration of Naval and Marine Air Ground Task Force (MAGTF) command elements into a cohesive fighting team.<sup>65</sup>

Additionally, the projection of power ashore while MAGTF command and support elements remain embarked will be experimented with, together with long range, sea based fire support.

b. Phase Two - URBAN WARRIOR (April 1997 - June 1998/July 1998 - May 1999).

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<sup>64</sup> R. Gangle, Senior Operations Advisor CWL, interview by author, 20 December 1996.

<sup>65</sup> R. Gangle, Senior Operations Advisor CWL, interview by author, 20 December 1996.

URBAN WARRIOR will be divided into three parts. The first will run from April 1997 to June 1998 and, "will focus on training of the experimental unit and Limited Objective Experiments."<sup>66</sup>

Part two will see LOEs continue and the activation of a Special Purpose Marine Air Ground Task Force (SPMAGTF[X]) to conduct an AWE. Concurrently with this, part three, which will be known as DIRTY WATER WARRIOR, will be run and, "will focus on littoral operations in archipelagos, rivers and coastal areas."<sup>67</sup>

c. Phase Three - CAPABLE WARRIOR (June 1999 - May 2001).

This will be the culmination of all experimentation conducted in the previous phases and should demonstrate, using an AWE and a SPMAGTF(X), the new capabilities derived from the FYEP.

#### SUMMARY

The SD experimental process is represents an innovative and visionary plan which will enable the USMC to experiment with ideas and concepts that may help it to react and respond to the emerging challenges of the twenty first century. However, it is important to understand that as an experimental process failures are expected, but from this process will rise the capabilities that will enable the USMC to meet any challenge or fight any enemy it faces. The RMC could learn from this process and adapt the recommendations appropriate to its structure and capabilities. The implications of this process for the RMC will therefore be discussed.

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<sup>66</sup> R. Gangle, Senior Operations Advisor CWL, interview by author, 20 December 1996.  
<sup>67</sup> R. Gangle, Senior Operations Advisor CWL, interview by author, 20 December 1996.

## CHAPTER 6

### SEA DRAGON AND THE ROYAL MARINES

*"...British policy will need to remain focused on maintaining a particularly close relationship with the United States in defence matters."*<sup>68</sup>

#### INTRODUCTION

The rapidly changing world, complete with its new range of security challenges, necessitates a dynamic approach to defence where capabilities need to be continually analysed and adjusted to match requirements in an environment of tight financial control. Within this atmosphere the SD experimental process searches for new concepts and capabilities for the USMC and it has offered the RMC the opportunity to participate and share findings.<sup>69</sup> There will be some results from the experiments which will not be applicable to the RMC by virtue of its size and roles in comparison to the USMC, but there will be many, as Hunter Warrior has already demonstrated, that will be invaluable.<sup>70</sup> It should be emphasised that SD participation is not intended to transform the RMC into a micro USMC, but rather it is aimed at enhancing or adopting successful and thoroughly experimented operational capabilities, which will improve the traditional roles and missions of 3 Cdo Bde RM. Additionally, the significance of the RN

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<sup>68</sup> Michael Portillo, British Security For The Period Up To 2010. 9.

<sup>69</sup> Colonel Tony Wood USMC, Director CWL, interview at 29 Palms during Exercise HUNTER WARRIOR by author, 6 March 1997.

must also be reinforced as both OMFTS and SD have described the fundamental roles that maritime forces play in delivery, fire support and sustainment of amphibious forces.<sup>71</sup> SD encompasses a variety of areas which holds relevance to the RMC, which will be discussed in turn. The framework for this will be provided by a short overview followed by the Components of Capabilities:<sup>72</sup> Manoeuvre, Fire Support, Protection, Control of the Electro-Magnetic (EM) spectrum, Command and Control, Information and Intelligence, Sustainability and Deployment. This structure is used since:

Components of Capabilities represent the functions performed by a force. They are generic and independent of level of conflict, command, branch, unit or weapon system. Their functional structure provides a means for examining all types of military activity for which a capability is required in terms of the same basic elements.<sup>73</sup>

It will conclude with three additional areas, doctrine, training and education, and operations in built up areas (OBUA), all of which require particular reference because of their relevance to the SD experimental process.

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<sup>70</sup> Exercise HUNTER WARRIOR visit. Author visited 5-6 March 1997 and initial results were demonstrated along with equipment and the Experimental Combat Operations Centre (ECOC).

<sup>71</sup> Lt Col P D George OBE RM (RMXO Quantico), interview by author, 25 April 1997.

<sup>72</sup> Towards a British Army of the 21st Century - Force Development Handbook,( Produced by Director General Development and Doctrine (DGD&D) March 1996). 4.1.

<sup>73</sup> Towards a British Army of the 21st Century - Force Development Handbook,( Produced by Director General Development and Doctrine (DGD&D) March 1996). 4-3.

## MANOEUVRE

Manoeuvre is at the heart of OMFTS and a concept central to the SD experimental process. It not only requires using the sea as a manoeuvre space for naval forces prior to any ship to shore movement, but it also requires a seamless transition to land for its use as a manoeuvre space. However, success depends on having the correct assets to launch personnel and equipment against the land quickly and from Over The Horizon (OTH). The USMC currently employs helicopters, landing craft, Landing Craft Air Cushioned (LCAC), and Amphibious Armoured Fighting Vehicles for traditionally conducted landings, but is due to enhance this capability to facilitate OTH landings with the V22 Osprey and the Advanced Amphibious Assault Vehicle (AAAV).

The cost of these equipments will initially preclude them from serious consideration by the RMC as procurement costs for the V-22 and AAAV are \$40 million and \$3 million respectively and neither are in production yet.<sup>74</sup> However it is entirely feasible for the RM to dovetail into USMC operations as an adjunct.<sup>75</sup> This is achievable by designating parallel zones for RM operations which take into account equipment capabilities and the particular theatre of operations.<sup>76</sup> The northern flank of NATO, for example, provides the arctic environment where the RM Mountain and Cold Weather expertise<sup>77</sup> would be a force multiplier for USMC amphibious operations. In this cold environment the AAAV has demonstrated operating difficulties along with a more general problem of achieving high speeds in conditions above sea

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<sup>74</sup> Anthony Jareb. (Deputy Director of Marine Corps Product Area, Center for Naval Analyses) Information provided via E-Mail, 25 April 1997.

<sup>75</sup> Lt Col P D George OBE, RM XO Quantico, interview by author, 3 April 1997.

<sup>76</sup> R. Gangle, Senior Operations Advisor CWL, interview by author, 16 April 1997.

<sup>77</sup> The United Kingdom Approach To Amphibious Operations, explains the operational capabilities required to be maintained by 3 Cdo Bde RM - specialising in Mountain and Cold Weather operations is one.

state three.<sup>78</sup> A further shortfall identified with the AAAV is "the hydrodynamics associated with high speed over the water [which] create an extremely complex system and an unacceptable maintenance burden, especially in the sea and sand environment of amphibious operations."<sup>79</sup> The RMC possesses the Landing Craft Utility (LCU) capable of transporting a wide range of vehicles ashore including the BV206 and the protected version the BV206(P). Despite being slower than the AAAV, the BV206(P) has a superior cross country capability in deep snow which should allow both systems to be employed in a complementary manner during USMC amphibious operations particularly in a cold weather environment.

Similarly, the LCAC cannot be matched by the Light LCAC (LLCAC) operated by the RMC, but a successor to the latter, the Medium LCAC (MLCAC), which is currently being investigated will help to bridge the differences and represents a useful adjunct which could also be used for raids into vulnerable enemy flanks. The RM regularly practice raiding operations using Rigid Raiding Craft (RRC) which represents another addition to USMC amphibious operations. This common ground also presents an opportunity for expertise to be shared during phase two of SD where DIRTY WATER WARRIOR "will focus on littoral operations in archipelagos, rivers and coastal areas."<sup>80</sup>

Helicopter lift, endurance and range are areas where the RM will have capability shortfalls compared to the USMC when the V22 is introduced with initial deliveries in 1999.<sup>81</sup> The ageing Sea King 4 medium support helicopter is due to be replaced by the Future

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<sup>78</sup> Lt Col P D George OBE, RMXO Quantico, interview by author, 3 April 1997.

<sup>79</sup> Ky L. Thompson. Lt Col, USMC-Ret., and Mark S. Rice, "Cost, Complexity May Doom USMC's Advanced Amphibian." Armed Forces Journal (April 1990)describes in detail the problems associated with AAAV.

<sup>80</sup> R. Gangle, Chief Operations Advisor CWL, interview by author, 20 December 1996.

<sup>81</sup> CWL, V-22 Program Summary provides extensive and impressive details of the how the V-22 is more capable than current helicopters in operation.

Amphibious Helicopter (FAH) from 2008.<sup>82</sup> As yet a successor to the FAH has not been identified; depending on the success of V22 it could be an option that may be considered, although inevitably the political ramifications of buying an American aircraft and its high cost may be prohibitive.

The significance of this discussion on manoeuvre for the RMC is threefold:

- a. Permanent RM Representation in the SD Experimental Process. Liaison is needed in the CWL as part of the SD experimental process at Lieutenant Colonel level<sup>83</sup> to develop integrated operations in parallel zones between the USMC and RM. This has scope to be increased to include operations with the United Kingdom and Netherlands Landing Force (UKNL LF).
- b. Raiding Operations Liaison. RM specialist knowledge of small boat operations for raiding operations and the DIRTY WATER WARRIOR experiments offer the opportunity for a temporary reciprocal attachment for an officer between a RM Raiding Squadron and the CWL.
- c. Aviation Liaison. The capability differences between the aviation support provided by the USMC and the RM are enormous, both now and in the future. The V22 will dramatically change the character of amphibious operations in the future; to monitor this the CWL should be approached to arrange for an aviation specialist, either RM or RN, to be temporarily attached to the SD process or at least visit and establish a working link.

## FIRE SUPPORT

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<sup>82</sup> The United Kingdom Approach To Amphibious Operations, (Draft paper written by the Maritime Warfare Centre, HMS DRYAD, UK).

<sup>83</sup> Colonel Tony Wood USMC, Director CWL, interview at 29 Palms by author, 6 March 1997.

The acquisition of target information through a variety of means, including Unmanned Aerial Vehicles (UAV), is essential for successful co-ordination of all types of fire if targets are to be destroyed. One of the missions of the CWL, tested during Exercise HUNTER WARRIOR, was "to develop the means to precisely target, co-ordinate, and deliver responsive, effective fire support to dispersed Marine units ashore."<sup>84</sup> The concept being tested involved covering the battlefield with a lattice of six man teams, infiltrated across a wide area, up to two hundred kilometres wide and deep,<sup>85</sup> all communicating securely to an Experimental Combat Operations Centre (ECOC), reporting enemy movement and locations which can then be engaged as the commander desires. To assist in this process the CWL "is employing a prototype Target Location, Designation and Handoff System (TLDHS), known as the Forward Observer/Forward Air Controller (FO/FAC)."<sup>86</sup> Employing GPS, an electronic compass, a laser range finder and a vertical angle measuring device, the FO/FAC accurately locates targets and simultaneously communicates them to the ECOC or any other fire support agencies that require it, which could include artillery, aviation and Naval Gunfire Support (NGS). To send routine messages, a Newton-Ericson palm sized digital computer was used which also automatically updated the ECOC with that team's position. The relevance of this concept to the RM is in the transfer of information which will be covered in more detail under the Command and Control heading. It is worth noting however that HUNTER WARRIOR successfully demonstrated that light weight, long range, digital communications and computers can combine to achieve an almost real time transfer of information, of which calling for fire support is an element.<sup>87</sup>

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<sup>84</sup> CMC Warfighting Lab Information pamphlet, Fires and Targeting

<sup>85</sup> Sea Dragon draft paper.

<sup>86</sup> CMC Warfighting Lab Information pamphlet, Fires and Targeting.

<sup>87</sup> R. Gangle, Chief Operations Advisor CWL, interview by author, 16 April 1997.

Significantly most of the digital equipment used in HUNTER WARRIOR was bought 'off the shelf' from civilian companies, the implication of being that to keep abreast of rapid advances in IT equipment traditional and lengthy methods of procurement will require revision.

The significance of this discussion on Fire Support is twofold although there are additional points that are amplified later in this paper.

- a. Digital Fire Support Co-ordination Equipment. Liaison should occur between the RN, the RMC and CWL to compare compatibility of equipment and assist in the development of new systems.
- b. Procurement. To keep pace with IT developments traditional procurement procedures should be revised to make use of 'off the shelf' technology.

## PROTECTION

The SD experimental process has yet to demonstrate capabilities permanently to protect aircraft from ground attack or landing craft, of whatever type, from mines. In the air it is possible to create corridors, for limited periods, protected by Electronic Warfare (EW) assets, Attack Helicopters (AH), and fixed wing aircraft,<sup>88</sup> but at sea there are currently no covert methods of mine clearance. However, the Office of Naval Research is spending \$0.5 billion<sup>89</sup> on mine research including MCM as is the RN where:

Current limitations mean that Mine Counter Measures operations in Shallow, Very Shallow Water and Surf Zone will be overt. Near future capabilities, if training and minor equipment requirements are met, will allow a covert capability to mark minefields. Future concepts envisage a covert wide area mine reconnaissance, detecting, marking and neutralisation capability.<sup>90</sup>

The significance of this for the RMC is twofold:

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<sup>88</sup> R. Gangle, Chief Operations Advisor CWL, interview by author, 16 April 1997.

<sup>89</sup> R. Gangle, Chief Operations Advisor CWL, interview by author, 16 April 1997.

<sup>90</sup> The United Kingdom Approach to Amphibious Operations (Draft paper written by the Maritime Warfare Centre, HMS DRYAD, UK).

a. AH. It reinforces the importance of having AH to protect Support Helicopters which may add strength to the argument for 3 Cdo Bde RM to have first call on the army's AH or, in the future, to have its own.

b. MCM. As both the USN and RN are developing MCM, closer liaison is needed to help develop capabilities which will be of joint benefit to the USMC and the RM.

One capability that was demonstrated extremely successfully during HUNTER WARRIOR were UAVs. They will be discussed in detail under Information and Intelligence but it is worth noting their suitability for flank protection.

## CONTROL OF THE EM SPECTRUM

Success in military operations is heavily dependent on the use of the E-M spectrum. Reliance on it is an implicit vulnerability to be exploited in the enemy whilst protected in oneself.<sup>91</sup>

SD represents a capability move towards greater availability of information through digital communications, although so far little has been demonstrated of attempts to protect the EM spectrum.

The significance of this to the RMC is twofold:

- a. Vulnerability of Digital Communications to Electronic Warfare (EW). If the RM, RN or both, are considering adopting new concepts arising from the SD experimental process their vulnerability to EW must be assessed.
- b. EW Liaison. The availability of an EW specialist within the RM should be assessed with a view to developing a direct link with the CWL.

## COMMAND AND CONTROL

In the SD experimental process this has been renamed "Command and Co-ordination" (C2) and is seen as the key to success on the modern battlefield. SD relies enormously on modern technology and C2 is the prime example as it seeks to create a "single integrated system, comprised of admin, logistic, intel, tactical, and fire support modules [that] must seamlessly cross the land/sea air/interface."<sup>92</sup> The concept aims to provide a digital information system that will draw on all sources to create a detailed picture of the battlefield, from which users can request information. This may be as mundane as a resupply arrival time or as crucial as the identification of some unknown personnel within the arcs of an Observation Post (OP). The difficulty with this concept is in the manner in which so much of the information is processed

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<sup>91</sup> Towards a British Army of the 21st Century - Force Development Handbook ( Produced by Director General Development and Doctrine (DGD&D). March 1996), 4-30.

and prioritised. HUNTER WARRIOR successfully demonstrated the system in operation but it was artificial due to the limited input. However, the CWL is currently developing, through the California Polytechnical University, the fourth generation Force Employment Analysis Tool (FEAT) which will process messages from as many different digital sources as possible and prioritise them according to the individual's requirements. The goal of this on going experiment is to incorporate into its programme 'Commander's Intent' which will adjust the information feed according to the state of the battle.<sup>93</sup> Whilst FEAT processes and distributes information it sits upon and is fed by subordinate systems, such as the Global Command Control System (GCCS) and the Joint Maritime Command Information System (JMCIS). Information flows between all three as a result of software, which can equally be written to facilitate allied digital IT systems feeding into FEAT and avoids having to procure the same systems as other nations.<sup>94</sup>

The significance of this to the RMC is twofold:

- a. Communication Information System (CIS) Liaison. Headquarters Royal Marines (HQRM) should consider forming a liaison with the CWL and maintaining a link through SO1 CIS to assess the extent to which the RM can enhance its digital communications with the USMC.
- b. CIS Liaison with the RN. CIS specialists are from the RN and RM are visiting the CWL in June 1997. After this initial liaison a permanent method for the future co-ordination of CIS between all parties should be established.

## INFORMATION AND INTELLIGENCE

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<sup>92</sup> Sea Dragon draft paper.

<sup>93</sup> R. Gangle, Chief Operations Advisor CWL, interview by author, 16 April 1997.

<sup>94</sup> Major 'Bull' Durham USMC, Operations Cell CWL, interview by author, 17 April 1997.

Since, "a manoeuvrist approach in the littoral seeks to collapse an enemy's cohesion and effectiveness through a series of rapid, violent and unexpected actions to create a turbulent and rapidly deteriorating situation with which he cannot cope"<sup>95</sup>, a constant stream of intelligence is essential to develop an enemy picture from which strengths and weaknesses can be assessed. UAVs are one area in which the SD process has been experimenting and achieving impressive results. In particular the ExDrone system equipped with a day/night capability camera which incorporates a Pan/Tilt/Zoom (PTZ) lens has worked well. ExDrone capabilities include an operating ceiling of 10,000 ft, top air speed of 100 mph, mission duration of 2.5 hours and a range of 50 miles. Employed during HUNTER WARRIOR, the ExDrone dramatically demonstrated the value of UAVs on the future battlefield by successfully exercising impressive capabilities achieving excellent results. These uses included: accurate deployment of Acoustic/Magnetic sensors; simultaneous deployment of four like UAVs deployed from one Ground Control Site (GCS) and controlled in-flight independently by forward teams; precision target location capability from a low cost air platform; complete integration of UAV derived data into an integrated battlefield situational awareness capability; and employment of a UAV system responsive to the needs of small forward deployed teams.<sup>96</sup>

During Exercise HUNTER WARRIOR ,digital communications were successfully used to transfer information generated by the UAVs directly to the ECOC.

The significance of this to the RMC is twofold:

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<sup>95</sup> A Concept for UK Maritime Power Projection in the Littoral and Ashore into the 21st Century, Draft Royal Navy paper.

<sup>96</sup>CMC Warfighting Lab Information pamphlet, A Study of the Use of an Exdrone UAV system in the Dispersed Battlefield.

- a. UAV Liaison with CWL. The success of the UAV experiments warrant on going liaison to be established between HQRM and CWL to develop further applications for the RM.
- b. Conduct of UAV LOEs in UK. To assist in the experimentation process the opportunities to conduct UAV LOEs as part of 3 Cdo Bde RM exercises should be seized. It is hoped this could include at least four ExDrones, to validate comparison with the HUNTER WARRIOR LOEs.

## SUSTAINABILITY

Sustainment operations during HUNTER WARRIOR saw some of the most innovative ideas originating from the SD experimental process being exercised. The resupply requirement for numerous small teams discretely scattered across the battlefield creates a new challenge, especially if CSS is predominantly sea based, with little or no footprint ashore and if the locations of the teams are to remain secure. The focus of sustainment experiments during HUNTER WARRIOR was the CSS ENTERPRISE, so named for two reasons: firstly, "because the word 'ENTERPRISE' means 'an undertaking of great scope, a business organization'"<sup>97</sup>; secondly to draw similarities to the ENTERPRISE of Star Trek, since "Star Trek symbolises the future and the application of new technology to evolving concepts and ideas."<sup>98</sup>

CSS ENTERPRISE was created from a small team of twelve staff in March 1996 and complemented by the CSS slice of the SPMAGTF(X) for HUNTER WARRIOR and was given its own identity because so many of the concepts it was exercising, originating out of various LOEs, were so radically different from conventional CSS methods. Essentially, CSS

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<sup>97</sup> CSS Enterprise Replacing Mass with Information & Speed. Information Booklet from Hunter Warrior,<sup>1</sup>

ENTERPRISE was "trying to develop new concepts more in-line with the commercial sector; like reducing order-ship-time and repair-cycle-time; right sizing inventories; out-sourcing; and direct vendor delivery."<sup>99</sup> In particular, through CSS ENTERPRISE, SD trialed various ideas designed to support OMFTS and the small-team infiltration concept which included: research and development of technology to limit dependence on fossil fuels; a computer C2 system to facilitate rapid request "and delivery of the support through a responsive distribution system using ground, piloted-air, or UAVs"<sup>100</sup>; automatic system fault diagnosis which will warn operators when problems are developing or fuel levels are low and the packaging and air delivery of supplies either remotely to a specified unit, or to a secure location where transponders will assist teams to find and "forage" from the supplies.<sup>101</sup>

HQRM was represented during Exercise HUNTER WARRIOR by SO1 Logistics who was also accompanied by an RN logistics representative and generated a lengthy report that described all the various CSS experiments<sup>102</sup>.

The significance of this is twofold:

- a. Logistic Operations Liaison. HQRM has already taken the initiative, through the Deputy Chief of Staff for Logistics (DCOS Log), to establish a liaison with the CWL

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<sup>98</sup> CSS Enterprise Replacing Mass with Information & Speed. Information Booklet from Hunter Warrior,1.

<sup>99</sup> CSS Enterprise Replacing Mass with Information & Speed. Information Booklet from Hunter Warrior,1.

<sup>100</sup> CSS Enterprise Replacing Mass with Information & Speed. Information Booklet from Hunter Warrior, 10.

<sup>101</sup> CSS Enterprise Replacing Mass with Information & Speed. Information Booklet from Hunter Warrior. All the different CSS experiments tried during HUNTER WARRIOR are detailed here should the reader require more details.

<sup>102</sup> SO1 Logistics HQRM Post Visit Report to Exercise HUNTER WARRIOR . Although not easily available this adequately describes the various CSS experiments and will support recommendations made in this paper to HQRM.

resulting in a visit to HQRM. This should be capitalised and developed to include RN and Army logisticians.

- b. Conduct of CSS LOEs in UK. CSS concepts identified as having application to the RM should generate offers to the CWL to conduct LOEs in UK, either in camp or on exercise.

## DEPLOYABILITY

By the nature of amphibious operations the sea will be the means by which the RM will invariably travel to troubled areas. This relationship reinforces the importance of the RN and RM link which should also extend into future maritime studies which include the SD process. Consequently, opportunities should be made for RN as well as RM involvement in the CWL.

The following three areas warrant consideration:

- a. A Permanent RN Appointment to the CWL. This would create a conduit for all RN matters into the CWL and facilitate the flow of information from it to the relevant departments in UK. Ideally the position should be filled by a Commander with amphibious expertise.
- b. RN and RFA Ships for AWEs. The provision of ships to take part in AWEs should be considered. In particular, URBAN WARRIOR in 1999 and CAPABLE WARRIOR in 2001 which is the culmination of the FYEP.
- c. C4I and CIS LOEs. Liaisons in these fields should aim to develop C4I and CIS LOEs that could be conducted by the RN.

## DOCTRINE

Current amphibious doctrine is based on BR 1806 'The Fundamentals of British Maritime Doctrine'. This is being currently updated, most notably by two documents, firstly, 'The United

Kingdom Approach to Amphibious Operations' produced by the Maritime Doctrine Cell at the Maritime Warfare Centre (MWC) in Great Britain, and secondly, by a draft RN paper titled 'A Concept for UK Maritime Power Projection in the Littoral and Ashore into the 21st Century'.

Experiments conducted by the CWL may develop capabilities which will affect the conduct of future UK amphibious operations. The significance of this to the RMC is that the MWC will have to be kept informed of developing capabilities to ensure that doctrine keeps pace. This is achievable through an RN conduit, if a RN officer is permanently posted to the CWL, which could also facilitate a link between CWL and RN Doctrinal/Concept meetings in future.

### TRAINING AND EDUCATION

The successful introduction of any new concepts will rest on the personnel who put it into practice; be it the systems operators or the commander with responsibility for understanding its potential for employment in a dynamic, three dimensional battlespace. Advancing technology has complicated both weapons and their supporting systems more than at any other time, while constantly changing battle environments require intelligent and experienced commanders with the mental agility to cope with a large information flow and rapid decision making. Preparing this emerging generation of technical warriors, capable of soldiering traditionally but armed with new technical skills necessary to operate new systems will require a comprehensive training and education programme. Learning new skills should not be the only element of training and education but a new approach designed to regularly test all skills, both individually and collectively, through employment of computer simulation, should be combined with traditional methods. This initiative has already been accepted by the British Army where preparations are in motion for the "award [of] a contract for the last phase of an ambitious 270 million pound

procurement of large, networked training systems begun in 1991."<sup>103</sup> Additionally, the increasing trend to use home computers should be capitalised upon, as identified by SD, by either making PCs available in units for personnel to regularly practice on, or by producing software which can be borrowed and used during free time.

The significance of this to the RMC is threefold:

- a. Involvement in the British Army's Network Training System. HQRM should consider approaching the Army to investigate the suitability of this system to the RM.
- b. Assessment of Developing SD Training Capabilities. The suggested visit by SO1 CIS to investigate digital communications should also include an assessment of developing computer training concepts.
- c. Conduct of Training and Education LOEs in UK. To assist in the SD experimental process, any training concepts identified as having application to 3 Cdo Bde RM, should be evaluated for their potential to be a LOE conducted in UK under the direction of HQRM on behalf of the CWL.

### OPERATIONS IN BUILT UP AREAS (OBUA)

The discussions earlier in this paper on population growth and its associated problem of migration towards large cities and towns, which is reinforced by the UN estimates that by 2025 eighty-five percent of the world's population will live in cities, of which over one hundred will have populations in excess of twenty million<sup>104</sup>, supports the CWL assessment that experimentation to investigate improving OBUA capabilities must be conducted. URBAN WARRIOR, which is phase three of SD, will be the AWE which will culminate out of LOEs

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<sup>103</sup> Giovanni de Briganti, "Virtual Battlefields Gain Europe's Nod." Defence News 2 (8 December 1996.)

investigating a variety of capabilities including: the use of UAVs, precision targeting and aviation support, all within an urban environment including high-rise buildings<sup>105</sup>. There has been an agreement made between the CMC and the CGRM for RM participation in URBAN WARRIOR, although details "have still to be defined, but will most likely include [OBUA] instructors, observers, and up to a troop strength unit in the AWE."<sup>106</sup>

The significance of this to the RMC is threefold:

- a. Enhanced Capabilities in OBUA. URBAN WARRIOR offers the opportunity to develop new operating capabilities in OBUA, such as techniques involving high-rise buildings, which the UK based training villages do not offer.
- b. Expertise Development within the RMC. RM personnel involved in the development of new OBUA capabilities will bring that specialist knowledge back to the RMC.
- c. Conduct of OBUA LOEs in UK. Certain OBUA LOEs may be able to be conducted as part of normal RM exercises in UK which are conducted in the OBUA training villages. This may also provide the opportunity for CWL personnel to visit the UK to observe RM OBUA training.

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<sup>104</sup> R. Gangle , Senior Operations Advisor CWL, interview with author, 20 December 1997. The figures quoted came from a UN conference "Habitat 2000".

<sup>105</sup> URBAN WARRIOR draft paper produced by the CWL.

<sup>106</sup> URBAN WARRIOR draft paper produced by the CWL.

## **CHAPTER 7**

### **RECOMMENDATIONS**

#### **1. PERMANENT RM REPRESENTATION IN THE SD EXPERIMENTAL PROCESS.**

Liaison is needed in the CWL as part of the SD experimental process at Lieutenant Colonel level<sup>107</sup> to develop integrated operations in parallel zones between the USMC and RM. This has scope to be increased to include operations with the United Kingdom and Netherlands Landing Force (UKNL LF).

#### **2. RAIDING OPERATIONS LIAISON.**

RM specialist knowledge of small boat operations for raiding operations and the DIRTY WATER WARRIOR experiments offer the opportunity for a temporary reciprocal attachment for an officer between a RM Raiding Squadron and the CWL.

#### **3. AVIATION LIAISON.**

The capability differences between the aviation support provided by the USMC and the RM are enormous, both now and in the future. The V22 will dramatically change amphibious operations in the future; to monitor this the CWL should be approached to arrange for an aviation specialist, either RM or RN, to be temporarily attached to the SD process or at least visit and establish a working link.

#### **4. DIGITAL FIRE SUPPORT CO-ORDINATION EQUIPMENT.**

Liaison should occur between the RN, the RMC and the CWL to compare compatibility of equipment and assist in the development of new systems..

5. **PROCUREMENT.**

To keep pace with IT developments traditional procurement procedures should be examined and if necessary revised to make use of 'off the shelf' technology.

6. **AH.**

The SD process reinforces the importance of having AH to protect Support Helicopters which may add strength to the argument for 3 Cdo Bde RM to have first call on the army's AH or, in the future, to have its own.

7. **MINE COUNTER MEASURES.**

As both the USN and RN are developing MCM, liaison should occur to help develop capabilities which will be of joint benefit to the USMC and the RM.

8. **VULNERABILITY OF DIGITAL COMMUNICATIONS TO EW.**

If the RM, RN or both, are considering adopting new concepts arising from the SD experimental process their vulnerability to EW must be assessed.

9. **EW LIAISON.**

The availability of an EW specialist within the RM should be assessed with a view to developing a direct link to the CWL.

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<sup>107</sup> Colonel Tony Wood USMC, Director CWL, interview at 29 Palms by author, 6 March 1997.

10. **COMMUNICATION INFORMATION SYSTEM (CIS) LIAISON.**

HQRM should consider forming a liaison with the CWL following the visit by SO1 CIS to assess the extent to which the RM can enhance its digital communications with the USMC.

11. **CIS LIAISON WITH THE RN.**

CIS specialists are from the RN and RM are visiting the CWL in June 1997. After this initial liaison a permanent method for the future co-ordination of CIS between all parties should be established.

12. **UAV LIAISON WITH CWL.**

The success of the UAV experiments warrant on going liaison to be established between HQRM and CWL to develop further applications for the RM.

13. **CONDUCT OF UAV LOES IN UK.**

To assist in the experimentation process the opportunities to conduct UAV LOEs as part of 3 Cdo Bde RM exercises should be seized. It is hoped this could include at least four ExDrones, to validate comparison with the HUNTER WARRIOR LOEs.

14. **LOGISTIC OPERATIONS LIAISON.**

HQRM has already taken the initiative, through the Deputy Chief of Staff for Logistics (DCOS Log), to establish a liaison with the CWL resulting in a visit to HQRM. This should be capitalised and developed to include RN and Army logisticians.

15. **CONDUCT OF CSS LOES IN UK.**

CSS concepts identified as having application to the RM should generate offers to the CWL to conduct LOEs in UK, either in camp or on exercise.

16. A PERMANENT RN APPOINTMENT TO THE CWL.

This would create a conduit for all RN matters into the CWL and facilitate the flow of information from it to the relevant departments in UK. Ideally the position should be filled by a Commander with amphibious expertise.

17. RN AND RFA SHIPS FOR AWES.

The provision of ships to take part in AWES should be considered. In particular, URBAN WARRIOR in 1999 and CAPABLE WARRIOR in 2001 which is the culmination of the FYEP.

18. C4I AND CIS LOES.

Liaisons in these fields should aim to develop C4I and CIS LOEs that could be conducted by the RN.

19. DOCTRINE.

An RN officer permanently posted to the CWL could facilitate a link between CWL and RN Doctrinal/Concept meetings in future. Failing this MWC should establish its own link into the CWL.

20. INVOLVEMENT IN THE BRITISH ARMY'S NETWORK TRAINING SYSTEM.

HQRM should consider approaching the army to investigate the suitability of this system to the RM.

21. ASSESSMENT OF DEVELOPING SD TRAINING CAPABILITIES.

The suggested visit by SO1 CIS to investigate digital communications should also include an assessment of developing computer training concepts.

22. CONDUCT OF TRAINING AND EDUCATION LOES IN UK.

To assist in the SD experimental process, any training concepts identified as having application to 3 Cdo Bde RM, should be evaluated for their potential to be a LOE conducted in UK under the direction of HQRM on behalf of the CWL.

23. ENHANCED CAPABILITIES IN OBUA.

URBAN WARRIOR offers the opportunity to develop new operating capabilities in OBUA, such as techniques involving high-rise buildings, which the UK based training villages do not offer.

24. EXPERTISE DEVELOPMENT WITHIN THE RMC.

RM personnel involved in the development of new OBUA capabilities will bring that specialist knowledge back to the RMC.

25. CONDUCT OF OBUA LOES IN UK.

Certain OBUA LOEs may be able to be conducted as part of normal RM exercises in UK which are conducted in the OBUA training villages. This may also provide the opportunity for CWL personnel to visit the UK to observe RM OBUA training.

## **CHAPTER 8**

### **CONCLUSION**

The global complexities arising out of the uncertainties created after the fall of the FSU have created an environment where, "growing interdependence of nations in economic and cultural terms, resource dependency, socio-economic disparities and demographic pressure in an increasingly competitive, fragile and populous world will continue to provide the potential for local and regional instability and breakdowns in order."<sup>108</sup> Reacting to this the USA embarked upon defence initiatives to prepare its armed forces to deal with threats from across the conflict spectrum. The USMC has responded to this by creating OMFTS and the innovative SD experimental process.

The UK has also acknowledged the need to develop strategies to respond to these global challenges and, as part of this, the RMC has begun to update its amphibious doctrine. The CWL has offered to involve the RMC in its experimental process and this paper has examined the opportunities that this offer has presented. The recommendations made vary from establishing a permanent appointment to arranging liaison visits; both have a common aim to generate closer links between the RM and the USMC and ultimately improve the amphibious capabilities of both the UK and USA.

## **GLOSSARY OF TERMS**

3 Cdo Bde RM - 3 Commando Brigade Royal Marines

AAAV - Advanced Amphibious Assault Vehicle

ACE - Air Combat Element

AH - Attack Helicopter

AWE - Advanced Warfighting Experiment

BDE - Brigade

CAS - Close Air Support

CDO - Commando

CE - Command Element

CGRM - Commandant General Royal Marines

CIS - Communication Information Systems

CSS - Combat Service Support

CSSE - Combat Service Support Element

CSSOC - Combat Service Support Officer Commanding

CVSG - Carrier Battle Group

CWL - Commandant's Warfighting Laboratory

C2 - Command and Co-ordination

DCOS Log - Deputy Chief of Staff for Logistics

DGD&D - Director General Development and Doctrine

DT - Dependent Territories

DR - Defence Role

ECOC - Experimental Combat Operations Centre

EM - Electro-magnetic

EW - Electronic Warfare

FAH - Future Amphibious Helicopter

FEAT - Force Employment Analysis Tool

FMF - Fleet Marine Force

FOFAC - Forward Observer/ Forward Air Controller

FSU - Former Soviet Union

FYEP - Five Year Experimental Plan

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<sup>108</sup> A Concept for UK Maritime Power Projection in the Littoral and Ashore into the 21st Century. Draft Royal Navy paper.

GCCS - Global Command Control System

GCS - Ground Control Site

GPS - Global Positioning System

IT - Information Technology

JMCIS - Joint Maritime Command Information System

JRDF - Joint Rapid Deployment Force

JV2010 - Joint Vision 2010

LCAC - Landing Craft Air Cushioned

LCU - Landing Craft Utility

LLCAC - Light Landing Craft Air Cushioned

LOE - Limited Objective Experiment

MAGTF - Marine Air Ground Task Force

MCM - Mine Counter Measures

MCMV - Mine Counter Measure Vessels

MLCAC - Medium Landing Craft Air Cushioned

NATO - North Atlantic Treaty Organisation

NCF - National Contingency Forces

NEF - Naval Expeditionary Force

NEO - Non-Combatant Evacuation Operations

NGS - Naval Gunfire Support

OBUA - Operations in Built Up Areas

OMFTS - Operational Manoeuvre From The Sea

OP - Observation Post

OTH - Over the Horizon

PC - Personnel Computer

PSO - Peace Support Operations

PTZ - Pan/ Tilt/ Zoom

RAF - Royal Air Force

RM - Royal Marines

RMC - Royal Marines Command

RMLO - Royal Marines Liaison Officer

RN - Royal Navy

SD - Sea Dragon

SEA - South East Asia

SPMAGTF - Special Purpose Marine Air Ground Task Force

SSN - Submerged Ship Nuclear

TCO - Tactical Combat Operations System

TLACS3 - Tactical Level Automated Combat Service Support System

TLDHS - Target Location, Designation and Handover System

UAV - Unmanned Aerial Vehicle

UK - United Kingdom

UN - United Nations

US - United States

USA - United States of America

USMC - United States Marine Corps

USN - United States Navy

UKNL LF - United Kingdom and Netherlands Landing Force

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